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ABSTRACT

This study was conducted to identify teaching styles that facilitate student progress on specific learning objectives. Initially, 15 step-wise multiple regression analyses were undertaken using the 44,448 classes in the IDEA database (IDEA center) for classes processed between August 1998 and August 2001, consisting of 1 analysis for each of the 12 learning objectives and 3 global outcomes defined by the IDEA Center. The analyses were repeated for each of 4 class sizes: 10-14 students, 15-34 students, 35-49 students, and 50 or more students. Findings show that progress on a few objectives was maximized by the same style, but there was no one style that was effective for all objectives. The relevance of the five teaching approaches previously identified by the IDEA Center depended on the objective being pursued. Six teaching styles were identified, each of which offered a model for enhancing different kinds of student growth. These styles were associated with: (1) pursuing cognitive objectives; (2) pursuing objectives stressing in-depth analysis and thought; (3) establishing student rapport and fostering student cooperation; (4) pursuing self-expression; (5) developing team skills; and (6) promoting progress in finding and using resources for problem solving. All six styles emphasized stimulating student interest. Overall, results suggest that those enrolled in "creatively oriented" classes generally identify with and endorse the class objectives. (SLD)

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IDEA Research Report #4

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IDEA CENTER

Teaching "Styles" and Learning Outcomes

Donald P. Hoyt and Eun-Joo Lee
The IDEA Center

This research seeks to identify teaching styles that facilitate student progress on specific learning objectives. It explores questions like, "Are the 'styles' that help students learn principles and theories different than those that facilitate the development of creative capacities or those that promote skills in critical analysis and evaluation?"

A few definitions are needed before the research is described.

Teaching Methods refer to specific instructional techniques or behaviors. The IDEA student ratings form includes 20 "method" items such as *Scheduled course work in ways which encouraged students to stay up-to-date in their work* or *Explained the reasons for criticisms of students' academic performance.*

Teaching Approach refers to a combination of teaching methods that are related either because they describe similar behaviors or have similar instructional purposes. In this study, five "approaches" were defined by selecting combinations of the IDEA system's "method" items. By adding ratings on these items together, scores were obtained on "scales" for assessing each approach.

Teaching Style refers to the way various teaching approaches are combined. For this study, a teaching style is defined by the relative emphasis given to each of the five approaches assessed by the IDEA system. Each "style" resembles a "recipe" in which the ingredients are teaching approaches combined in ways designed to produce an optimal outcome.

Names, descriptions, and content of the five scales for measuring teaching approaches are given below. (Item numbers reflect the IDEA Diagnostic Form.)

Stimulating Student Interest. Those who score high on this scale spend time and effort enlisting student interest and curiosity. They seek to establish an atmosphere that gets students excited about the subject matter.

4. Demonstrated the importance and significance of the subject matter
8. Stimulated students to intellectual effort beyond that required by most courses
13. Introduced stimulating ideas about the subject
15. Inspired students to set and achieve goals which really challenged them

Fostering Student Collaboration. Faculty scoring high on this scale find ways for students to learn from each other. They establish an atmosphere that capitalizes on the adage that "the best way to learn something is to teach it."

5. Formed "teams" or "discussion groups" to facilitate learning
16. Asked students to share ideas and experiences with others whose backgrounds and viewpoints differ from their own
18. Asked students to help each other understand ideas or concepts

Establishing Rapport. Those scoring high on this scale communicate caring through the relationships they establish with their students. By displaying their concern for how well students are learning, such instructors create an atmosphere that encourages student effort and commitment.

1. Displayed a personal interest in students and their learning
2. Found ways to help students answer their own questions
7. Explained the reasons for criticisms of students' academic performance
20. Encouraged student-faculty interaction outside of class (office visits, phone calls, e-mail, etc.)

Encouraging Student Involvement. High scores indicate that the faculty member encourages students to become personally involved/identified with the subject matter. The classroom atmosphere they establish places more emphasis on problem solving than on acquiring information.

9. Encouraged students to use multiple resources (e.g., data banks, library holdings, outside experts) to improve understanding
11. Related course material to real life situations
14. Involved students in "hands on" projects such as research, case studies, or "real life" activities
19. Gave projects, tests, or assignments that required original or creative thinking

Structuring Classroom Experiences. High scores are characteristic of teachers who organize and plan their classes in ways that facilitate student learning. The atmosphere reflects the instructor's commitment to clear communication of both subject matter and his/her expectations.

3. Scheduled course work (class activities, tests, projects) in ways which encouraged students to stay up-to-date in their work
6. Made it clear how each topic fit into the course
10. Explained course material clearly and concisely
12. Gave tests, projects, etc. that covered the most important points of the course
17. Provided timely and frequent feedback on tests, reports, projects, etc. to help students improve

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This research sought to discover the optimum combination of these approaches for facilitating progress on each of the 12 IDEA objectives. In addition, it examined scale combinations most predictive of overall (global) ratings of the instructor, the course, and of student attitudes toward the field of study. Finally, it explored the impact of class size on conclusions.

Procedure

Initially, 15 step-wise multiple regression analyses were undertaken using the 44,448 classes in the IDEA database for classes processed between August 1998 and August 2001—one analysis for each of the 12 learning objectives and the 3 global outcomes. To examine the impact of class size, these analyses were repeated for four class sizes—10-14 students; 15-34; 35-49; and 50 or more.

The research question was, "Does a given teaching approach (scale) make an independent contribution to progress ratings after the contributions of other approaches (scales) have been taken into account?" The step-wise multiple regression approach helps to answer that question. It first selects the scale most closely related to the progress rating being studied and determines the portion of variability in progress ratings that it "explains." Then, it determines which of the other four scales accounts for the largest percentage of the remaining variance. This process is continued until either all five scales have been selected or the selection of a new scale makes no significant reduction in the "unexplained" variance.

The scales selected in each analysis, together with the magnitude of their regression weights (their relative importance for predicting progress ratings on a given objective), define the "styles" which are the subject of this study.

To simplify our results, regression weights were classified according to their size. Weights of .15 or higher were called "High (H);" those from .08 to .14 were called "Moderate" (M); those between .03 and .07 were called "Low" (L); those from +.02 to -.02 were called "Zero" (0);[1] and those from -.03 to -.05 were called "Negative (N)." A negative weight indicates that, although the approach may have generally positive effects, its use in a given situation may preclude or interfere with the use of more effective approaches and, therefore, should be discouraged.

Results

Specific Objectives. When teaching approaches were optimally combined, a large share of the variation in student progress ratings was "explained." The percent of variance accounted for ranged from 43.2 (for the objective concerned with a broad liberal education) to 75.6 (for the objective related to acquiring an interest in learning); the average was 61.1 percent. Clearly, teaching style was closely related to student ratings of progress.

Each of the five scales was positively related to progress ratings on all 12 objectives. That is, each scale represents some positive facet of instruction. But scores on these scales also overlapped considerably (were positively related to each other)[2].

For 8 of the 12 objectives, a "High" regression weight was found for *Stimulating Student Interest*. For the other four objectives, this scale had a "Low" or "Moderate" regression weight. Obviously, an important key to effective instruction is the ability to excite and inspire students; little learning will occur in the absence of motivation.

Of the eight objectives where the regression weight for *Stimulating Student Interest* was "High," four were clearly "cognitively" oriented. Two of these stressed basic cognitive background (*Gaining factual knowledge; Learning principles and theories*) while the other two had an "applied" emphasis (*Learning to apply course materials; Developing professional skills and attitudes*). In all four of these instances, the most effective "style" included not only a "High" emphasis on *Stimulating Student Interest* but also a "Low" emphasis on *Structuring Classroom Experiences*, a scale that stresses clear communication of content and expectations. For these four objectives, the regression weight was zero for both *Establishing Rapport* and *Fostering Student Collaboration*[3]. The two objectives with an "applied" emphasis were distinguished from those concerned with "basic cognitive development" by the presence of a "Low" regression weight on the *Encouraging Student Involvement* scale; this weight was zero for the two basic cognitive objectives.

The most effective teaching style (Style A) for these cognitive objectives is summarized below (item numbers reflect the IDEA Diagnostic Form).

Objectives for Teaching Style A	*Stimulate Interest*	*Foster Collaboration*	*Establish Rapport*	*Encourage Involvement*	*Structure Classroom*
21. Gaining factual knowledge	H	N	0	0	L
22. Learn principles, theories	H	0	0	0	L
23. Apply course material	H	0	0	L	L
24. Professional skills, attitudes	H	0	0	L	L

Stimulating Student Interest also had a high regression weight for four other objectives. When the pattern of other regression weights was examined, these four could be classified into two closely related types (Style B and Style C) as shown below:

Objectives for Teaching Style B	*Stimulate Interest*	*Foster Collaboration*	*Establish Rapport*	*Encourage Involvement*	*Structure Classroom*
30. Values development	H	M	N	0	0
31. Critical analysis, evaluation	H	M	0	0	0

Objectives for Teaching Style C	*Stimulate Interest*	*Foster Collaboration*	*Establish Rapport*	*Encourage Involvement*	*Structure Classroom*
27. Broad liberal education	H	L	0	N	0
32. Increased interest in learning	H	L	L	0	0

Styles B and C both combined a strong emphasis on *Stimulating Student Interest* with a lesser emphasis on *Fostering Student Collaboration* and no emphasis on *Structuring the Classroom*. For Style B, *Fostering Collaboration* was somewhat more influential than for Style C. These styles also differed on the role of *Establishing Rapport*, which had a negative weight for the *Values development* objective (Style B) but a low positive weight for *Increased interest in learning* (Style C). For the other two objectives, its weight was zero.

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[1] A few of these were statistically significant, but all were too low to have practical significance.

[2] This is not surprising. When an instructor employs a method designed to stimulate interest, he/she may at the same time be establishing rapport, encouraging student involvement, or fostering student collaboration. Almost all communication has more than one effect.

[3] A minor exception was *Gaining factual knowledge* where the regression weight for Fostering Student Collaboration was slightly negative.

Style D featured diversity and versatility in instruction. Positive regression weights were found for four of the five scales describing teaching approaches. This pattern produced the highest progress ratings on two "expressive" objectives: *Creative Capacities* and *Communication Skills*. Specific teaching styles are depicted below:

Objectives for Teaching Style D	*Stimulate Interest*	*Foster Collaboration*	*Establish Rapport*	*Encourage Involvement*	*Structure Classroom*
26. Creative capacities	M	L	M	M	0
28. Communication skill	L	M	M	L	0

Although there were minor differences in the size of the regression weights, the most effective teaching style for both of these objectives required a diverse set of approaches. These objectives were distinctive in the stress they placed on *Establishing Rapport*. Student involvement, either through collaborative learning or through individual activities, was also important. Like other objectives, Stimulating Student Interest was helpful, although it was not as dominant as it was for most other objectives.

The teaching styles that promoted the highest progress ratings on *Team skills* and *Finding and using resources* were both unique. As might be expected, for *Team skills*, the most relevant teaching approach was *Fostering Student Collaboration*. The style that promoted progress on this objective also included "Low" emphases on *Stimulating Student Interest* and *Encouraging Student Involvement*, along with a suggestion that *Structuring Classroom Experiences* be downplayed in order to maximize more relevant approaches (Style E).

Objectives for Teaching Style E	*Stimulate Interest*	*Foster Collaboration*	*Establish Rapport*	*Encourage Involvement*	*Structure Classroom*
25. Team skills	L	H	0	L	N

Progress on the final objective (*Finding and using resources*) was enhanced chiefly by Style F, characterized by its stress on *Encouraging Student Involvement* with lesser emphases on *Stimulating Student Interest* and *Establishing Rapport*.

Objectives for Teaching Style F	*Stimulate Interest*	*Foster Collaboration*	*Establish Rapport*	*Encourage Involvement*	*Structure Classroom*
29. Finding and using resources	L	0	L	H	0

Global Ratings. Results for two of the global ratings–"Increased Positive Attitude" and "Excellent Course"–were similar. On both, the two scales featured in Style A were significantly related to ratings–*Stimulating Student Interest* (primarily) and *Structuring the Classroom* (secondarily). Instructors who focused so much effort on student-faculty interactions (*Establishing Rapport*) that the two most important emphases had to be neglected were likely to receive somewhat lower ratings.

Results for the other global rating ("Excellent teacher") were quite different. Nearly equal relevance was attributed to three scales: *Classroom Structuring, Establishing Rapport*, and *Stimulating Student Interest*. The most "popular" instructors focused efforts on clearly communicating course content and expectations, interacting with students in a caring manner, and stimulating their interest/enthusiasm about the subject.

For the three global ratings, neither *Fostering Collaboration* nor *Encouraging Involvement* added significantly to the prediction of success. Although these instructional emphases were related to success in attaining specific objectives, they appeared to have little relevance for the broad impressions students have of their class experience.

The Impact of Class Size

Individual Objectives. Results for the four class sizes were very similar for 7 of the 12 learning objectives–*Principles and theories, Team skills, Broad liberal education, Communication Skills, Finding/using resources, Critical analysis*, and *Interest in learning*.* For the other five objectives, results were systematically affected by class size.

For three cognitively oriented objectives (*Factual knowledge, Applications, Professional skills and viewpoints*), the larger the class the more important was *Stimulating Student Interest* and the less important was *Structuring the Classroom*. The average regression weight for the former was .11 for classes enrolling 10-14 students, increasing to .16 for those enrolling 15-34, and to .17 and .23 for the two largest size classes, respectively. For these three objectives, regression weights for *Structuring the Classroom* regularly decreased with class size (averages were .05, .04, .03, and .00 for the four class sizes).

In classes where the development of *Creative capacities* was stressed, the relative importance of two other approaches varied with class size. The larger the class the more important was *Fostering Student Collaboration* (regression weights for the four class sizes, beginning with the smallest, were .04, .05, .14, and .32) and the less important was *Establishing Rapport* (regression weights of .10, .08, .01, and .00).

Finally, in classes where *Developing an understanding of and commitment to personal values* was stressed, the importance of *Stimulating Student Interest* increased with class size (regression weights for the four classes sizes were .16, .20, .21, and .30) while that of *Fostering Student Collaboration* declined (regression weights of .12, .09, .06, and .02).

Global Ratings. For two of the global ratings (*Increased positive attitude toward the field* and *Excellence of the course*), regression weights on two scales systematically changed as class size increased. The larger the class, the more influential was *Stimulating Student Interest* (average regression weights, beginning with the smallest size, were .15, .18, .20, and .24). The regression weight for *Establishing Rapport* became more negative (suggesting that instructional efforts should be directed to more effective approaches) as class size increased; averages were .00, -.02, -.05, and -.06.

* There were occasional differences in the magnitude of regression weights for classes of different sizes; but since these did not form regular patterns (decreasing or increasing with size) they were considered "anomalies" and no attempt was made to further describe or interpret them.

Summary and Conclusions

1. Progress on a few objectives was maximized by the same style; but there was no one style that was effective for all objectives. The relevance of the five teaching approaches depended on the objective being pursued.

2. Six teaching styles were identified, each of which offered a model for enhancing different kinds of student growth:
   a. Style A is encouraged for those pursuing cognitive objectives. This style required a primary emphasis on stimulating student interest. At the same time, it required clear communication of both the subject matter and the instructor's expectations. Minor modifications in this style will be required depending on whether basic cognitive knowledge or applications of that knowledge are being pursued.
   b. Progress on objectives stressing in-depth analysis and thought (values development; critical analysis and evaluation) was maximized when Style B was employed. Like Style A, this style stressed stimulating interest; but it supplemented this approach with a strong emphasis on fostering student collaboration.
   c. Style C was similar to Style B. The main difference was that in Style C fostering student collaboration was less important while establishing rapport was slightly more important. This style optimized growth on objectives commonly associated with "general education"—gaining a broader understanding and appreciation for intellectual/cultural activities and acquiring an interest in learning more by pursuing one's own questions.
   d. Progress on two objectives featuring self-expression (developing creative capacities and gaining communication skills) was enhanced by Style D, a style featuring versatility and diversity in instruction. This style combined all of the approaches except the one concerned with classroom structuring. Its emphasis on establishing rapport differentiated it from other approaches.
   e. Style E was of special value for when team skills was the class objective. It placed its major emphasis on fostering collaboration, supplemented by some emphasis on encouraging involvement and stimulating interest.
   f. Style F was associated with progress on the objective of learning to find and use resources for problem solving. Its primary stress was on involving students in the learning process; minor emphases on both stimulating student interest and establishing rapport were also a part of this style.

3. The six styles identified in this study had in common an emphasis on the importance of *Stimulating Student Interest*. Although its impact varied among the 12 objectives, it can safely be concluded that learning of all types is enhanced when teachers succeed in exciting their students about the subject matter.

4. Overall ratings of the course and of attitudes toward the subject matter were maximized when Style A was employed (primary emphasis on stimulating interest; secondary emphasis on structuring). Results for the other global criterion (excellence of the instructor) differed in two ways: (1) Clear communication of content and expectations (*Structuring the Classroom*) was much more important than for other global ratings; and (2) *Establishing Rapport* was as important as *Stimulating Student Interest* in maximizing ratings on this criterion.

5. On 5 of the 12 objectives, results varied with class size. For three cognitive objectives, the importance of stimulating student interest increased with class size, suggesting that, for such objectives, as class conditions favor student anonymity, it becomes more vital to excite student interest. When developing creative capacities was an objective, fostering student collaboration increased in importance as class size increased, while establishing rapport declined; large classes make rapport building difficult, but do not preclude the design of collaborative opportunities. In contrast to the creative capacities objective, the one concerned with developing personal values was <u>less</u> effectively addressed by fostering collaboration as class size increased while the importance of stimulating student interest increased. It seems probable that those enrolled in "creatively-oriented" classes generally identify with and endorse the class's objectives. This may not be true of those in classes seeking to explore personal values, where learning may be resisted because of its personal nature.

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